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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/912,315	07/26/2001	Hideo Kobayashi	110207	4956

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EXAMINER
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NGUYEN, KEVIN M

ART UNIT	PAPER NUMBER
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2674

DATE MAILED: 02/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/912,315

**Applicant(s)**

KOBAYASHI ET AL.

**Examiner**

Kevin M. Nguyen

**Art Unit**

2674

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 3,4,17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3,4,17 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. This office action is made in response to applicant's amendment filed on 07/02/2004. Claims 1, 2 and 5-16 are cancelled, claims 3, 4, 17 and 18 are amended, and claims 3, 4, 17 and 18 are currently pending in the application. An action follows below:

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 3, 4, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (previously cited) in view of Nakajima (JP 07-225387).

4. As to claim 3, Tanaka teaches an apparatus associated with a method, the apparatus comprising:

Ferroelectric liquid crystals layer FLC 903 (a display element, fig. 9), a photoconductive layer 902 (an optical switching element, fig. 9).

[recited in lines 5-7 of claim 3]

Fig. 10 shows current-voltage characteristics 1002 and 1001 with and without light irradiation (col. 14, lines 24-25).

[recited in lines 7-8 of claim 3]

The photoconductive layer 902 has the diode characteristics, so that the photoconductive layer 902 is in a low-resistance state during the application of forward

Art Unit: 2674

bias voltage, and is in a high-resistance state during the application of reverse bias voltage (fig. 9, col. 14, lines 12-22).

The applied driving voltage is greater than the 0.7 volts (a threshold voltage of the diode); therefore, the display element 903 is turned on.

“The low-resistance state during the application of forward bias voltage, and is in a high-resistance state during the application of reverse bias voltage” defined a ratio of the resistance being controlled at least depending on a direction of an applied bias voltage.

[recited in lines 9-12 of claim 3]

The photoconductive layer 902 becomes into the forward-biased state, and the FLC layer 903 becomes into the OFF state (corresponding to the A point in Fig. 12,  $P=P_s$ ). In this case, the applied voltage  $V_f$  to the FLC layer 903 is obtained by the following equation, as indicated by the broken line,  $V_f=V_e-V_d$ . The applied charge  $Q$  is obtained by  $Q=C_f(V_e-V_d)+P_s (>Q_1)$  (col. 16, lines 7-13).

Thus, “the applied charge  $Q$  is obtained by  $Q=C_f(V_e-V_d)+P_s (>Q_1)$ ” defined an electrical charge amount of the display element. “The FLC layer 903 becomes into the OFF state” defined turning off the voltage applied to the recording medium.

Accordingly, Tanaka teaches all of the claimed limitation of claim 3, except for “the display is turned off by applying a residual voltage, the residual voltage corresponding to the electrical charge amount and being effectively smaller than the threshold voltage.

However, Nakajima teaches a related LCD device which discharges residual electrical charges in a short time after the power source of the LCD device is turned off (the display is turned off) (see purpose, lines 1-3). It is obvious the discharge of residual electrical charges inherent is smaller than the threshold voltage.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Tanaka's applied voltage including discharges residual electrical charges in a short time after the power source of the LCD device is turned off, in view of the teaching in Nakajima's reference because this would prevent liquid crystal molecules and switching elements from deteriorating by grounding a counter electrode (see purpose, lines 4-5).

5. As to claim 17, referring to the rejection of claim 3 above.

6. As to claim 4, Nanaka et al teaches an apparatus associated with a method, the apparatus comprising:

[recited in line 5-7 of claim 4]

Fig. 10 shows current-voltage characteristics 1002 and 1001 with and without light irradiation (col. 14, lines 24-25). Thus, during without light irradiation corresponding to reverse bias voltage of the diode. There is no voltage applied to the FLC 903, so that the applied driving voltage is smaller than the 0.7 volts (a threshold voltage of the diode); therefore, the display element 903 is turned off.

[recited in lines 8-13 of claim 4]

Tanaka further teaches "the applied charge Q is obtained by  $Q = C_f(V_e - V_d) + P_s$  ( $> Q_1$ )" (col. 16, lines 12-13) that defined controlling an electrical charge amount of the

Art Unit: 2674

display element. In forward bias voltage, the applied driving voltage is greater than the 0.7 volts (a threshold voltage of the diode) to turn on the display element 903.

"The low-resistance state during the application of forward bias voltage" defined the decrease the resistance component of the optical switching element 902.

Accordingly, Tanaka teaches all of the claimed limitation of claim 4, except for "the decrease of the residual voltage corresponding to the electrical charge amount."

However, Nakajima teaches a related LCD device which discharges (decreases) residual electrical charges in a short time (see purpose, lines 1-2).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Tanaka's applied voltage including discharges residual electrical charges in a short time, in view of the teaching in Nakajima's reference because this would prevent liquid crystal molecules and switching elements from deteriorating by grounding a counter electrode (see purpose, lines 4-5).

7. As to claim 18, referring to the rejection of claim 4 above.

### ***Response to Arguments***

8. Applicant's arguments filed 11/8/2004 have been fully considered but they are not persuasive.

9. Examiner clarifies the teaching of Tanaka's reference that provides and establishes the "substantial evidence" to produce and result the claimed limitations of claims 3, 4, 17 and 18.

10. Applicant argues features in the independent claims 3, 4, 17 and 18 that are newly recited. Thus, new grounds of rejection have been used.

Art Unit: 2674

11. In response to applicant's argument that claims 3 and 17 recite "turning off a display by applying a residual voltage, the residual voltage corresponding to the electrical charge, effectively smaller than the threshold voltage." This argument is not persuasive because Nakajima teaches a related LCD device which discharges residual electrical charges in a short time after the power source of the LCD device is turned off (the display is turned off) (see purpose, lines 1-3). It is obvious the discharge of residual electrical charges inherent is smaller than the threshold voltage.

12. In response to applicant's argument that claims 4 and 18 recite "controlling electrical charge amount of the display element, and applied voltage exceeding the threshold voltage due to a partial voltage increased by the decrease of the resistance component of the optical switching element and an effectively generated voltage caused by a residual voltage corresponding to the electrical charge." This argument is not persuasive because Tanaka teaches "the applied charge  $Q$  is obtained by  $Q = C_f(V_e - V_d) + P_s (> Q_1)$ " (col. 16, lines 12-13) that defined controlling an electrical charge amount of the display element. In forward bias voltage, the applied driving voltage is greater than the 0.7 volts (a threshold voltage of the diode) to turn on the display element 903. "The low-resistance state during the application of forward bias voltage" defined the decrease the resistance component of the optical switching element 902.

Nakajima teaches a related LCD device which discharges residual electrical charges in a short time (see purpose, lines 1-2).

Therefore, the teaching of Tanaka's reference in view of the teaching of Nakajima's reference provide and establish the "substantial evidence" to produce and result the claimed limitations of claims 4 and 18.

For these reasons, the rejections based on Tanaka et al and Nakajima have been maintained.

### ***Conclusion***

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Nguyen whose telephone number is 703-305-6209. The examiner can normally be reached on MON-THU from 8:00-6:00 pm.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick N. Edouard can be reached on 703-308-6725. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the Patent Application Information Retrieval system, see <http://portal.uspto.gov/external/portal/pair>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin M. Nguyen  
Patent Examiner  
Art Unit 2674

KMN  
February 1st, 2005

  
**XIAO WU**  
**PRIMARY EXAMINER**